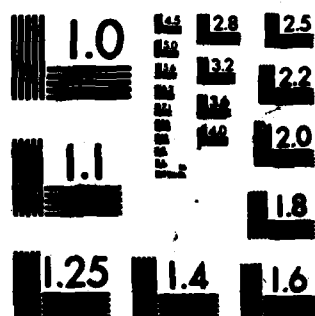


AD-A180 216

FIELD EVALUATION OF AUSTRALIAN RATION PACKS REVISION OF 1/1  
COMBAT RATION TEN. (U) ARMED FORCES FOOD SCIENCE  
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Department of Defence

Defence Science and Technology Organisation

Armed Forces Food Science Establishment

Scottsdale, Tasmania

AFFSE REPORT 1/87

FIELD EVALUATION OF  
AUSTRALIAN RATION PACKS  
REVISION OF  
COMBAT RATION TEN MAN (U)

C. H. FORBES-EWAN

D. R. WATERS

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AFFSE REPORT 1/87

**FIELD EVALUATION OF  
AUSTRALIAN RATION PACKS  
REVISION OF COMBAT RATION TEN MAN**

(U)

C. H. FORBES-EWAN and D. R. WATERS

SUMMARY

Two field acceptability studies showed that the Combat Ration Ten Man (CR10M) needs more total food, a greater variety of food and drinks and the addition of snack items such as confectionery.

Recommendations to improve both the acceptability and nutritional adequacy of CR10M are made. A sample revised menu is presented.



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Department of Defence

**DOCUMENT CONTROL DATA SHEET**

1.a. AR No. 005-024	1.b. Establishment No. AFFSE REPORT 1/87	2. Document Date FEB 87	3. Task No. 85/018
4. Title FIELD EVALUATION OF AUSTRALIAN RATION PACKS: REVISION OF COMBAT RATION TEN MAN (U)		5. Security a. document b. title UNCLAS c. UNCLAS	6. No. of Pages 24
			7. No. Refs. 12
8. Author(s) C. H. FORBES-EWAN D. R. WATERS		9. Downgrading Instructions  NOT APPLICABLE	
10. Corporate Author and Address ARMED FORCES FOOD SCIENCE ESTABLISHMENT P.O. BOX 147 SCOTTSDALE, TAS. 7254		11. Authority (as appropriate) a. Sponsor b. Security c. Downgrading d. Approval  DOD (ARMY)	

12. Secondary Distribution (of this document)

APPROVED FOR PUBLIC RELEASE

Overseas enquirers outside stated limitations should be referred through ASDIS, Defence Information Services Branch, Department of Defence, Campbell Park, Canberra, ACT 2601

13. a. This document may be announced in catalogues and awareness services available to ...

NO LIMITATIONS

13. b. Citation for other purposes.

NO LIMITATIONS

14. Descriptors RATIONS FIELD RATIONS MILITARY RATIONS ACCEPTABILITY EVALUATION	15. COSATI Group  0608
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16. Abstract

Two field acceptability studies showed that the Combat Ration Ten Man (CR10M) needs more total food, a greater variety of food and drinks and the addition of snack items such as confectionery.

Recommendations to improve both the acceptability and nutritional adequacy of CR10M are made. A sample revised menu is presented.

## CONTENTS

	Page No.
INTRODUCTION .....	1
METHODS .....	1
RESULTS .....	2
Interpretation of Results .....	2
1. Characteristics of the Groups .....	3
2. Cereal Supplement .....	3
3. Soup Powders .....	3
4. Canned Vegetables .....	4
5. Desserts .....	6
6. Condiments .....	6
7. Spreads .....	7
8. Drinks .....	8
9. Meat Packs .....	9
10. Non Food Items .....	11
11. Ration Pack — General .....	12
DISCUSSION .....	13
1. Cereal Supplement .....	13
2. Soup Powders .....	13
3. Canned Soups .....	13
4. Desserts .....	14
5. Condiments .....	14
6. Spreads .....	14
7. Drinks .....	15
8. Main Meals .....	15
9. Non Food Items .....	16
10. Ration Pack — General .....	16
11. Effect of Recommendations on Energy of CR10M .....	17
CONCLUSIONS .....	18
RECOMMENDATIONS .....	19
REFERENCES .....	20
ANNEX A. COMMENTS OBTAINED FROM THE FIELD .....	21
ANNEX B. SAMPLE REVISED MENU .....	23

## INTRODUCTION

The Australian Army uses five types of combat ration packs: Combat Ration One Man (CR1M), Individual Meal Combat Ration (IMCR), Patrol Ration One Man (PR1M), Combat Ration Ten Man (CR10M) and Emergency Ration (ER). The characteristics of combat rations are described in detail in ASR69.1 (DOD, 1985).

CR1M has already been revised (Forbes-Ewan & Waters, 1986). The IMCR is a new ration pack. It is designed to provide food and beverages for a period which includes one normal meal time. It is being field tested in late 1986. PR1M has recently been altered to include 5 menus (previously 3) and to have more complex carbohydrate and less protein. PR1M will be field tested in 1987.

This report concerns the field acceptability and service suitability of CR10M. The last report on CR10M was that of Badcock (1985).

CR10M provides food for ten men for one day. It is to be the basis of rationing during the more stable and static periods of operations but when conditions prevent the use of fresh or canned equivalent rations. CR10M must be capable of being divided into two sub-packs with five rations in each; it must be capable of preparation in 10 minutes with a minimum of additional equipment; its main meal components must be edible hot or cold and have a minimum shelf life of nine months (tropics) or twelve months (temperate conditions) (DOD, 1985). All combat rations should consist of components made in Australia, they must satisfy nutritional requirements and they must be acceptable to Australian servicemen (DOD, 1985).

## METHODS

The study comprised two field trips using questionnaires to gain objective data on acceptability of all food items and service suitability of non food items in each menu of CR10M. A copy of the questionnaire is enclosed. An observer spent several days in the field at each exercise, living on CR10M and gaining subjective impressions by discussions with small groups. These discussions preceded the completion of the questionnaires and enabled the observer to encourage subjects to clarify their ideas.

The questionnaire was designed with assistance from 1 Psych Unit (Army). It attempts to gain the maximum amount of information possible i.e. did the soldier like the item; was there enough; if he did not like it; how could it be improved; if improvement is out of the question, what is a suitable replacement?

Field Force Command (FFComd) assisted with the identification of field exercises suitable for our study. Criteria for suitability were:

- (1) CR10M should form the sole or at least main form of rationing for the period of study;
- (2) CR10M should be prepared by members of the Australian Army Catering Corps and by small groups of soldiers themselves.
- (3) At least 200 soldiers are required for each field study;
- (4) The soldiers should be from units which are frequently rationed with CR10M;
- (5) All varieties of CR10M should be issued in approximately equal proportions;
- (6) An observer from AFFSE should be able to discuss the packs with small groups of users, e.g. sections.

Two exercises were chosen from those identified as suitable by FFComd: Exercise Prairie Trail, 16AD Regt, Woomera, March 86 and Exercise Tasman Link, 1 Field Regt, Shoalwater Bay Training Area (SBTA) May/June 86. These exercises provided contrasting climatic conditions and workloads.

At Ex Prairie Trail, soldiers were required to work very hard; estimated work output was Grade 3 (NH & MRC, 1984) in extremes of temperature. With little or no shade available, day temperatures were always over 30 degrees while nights were clear and cool. Soldiers at Ex Tasman Link were doing infrequent periods of moderately hard work (estimated at Grade 1, NH & MRC, 1984). The climate was mild. A dry sclerophyll forest provided shade and soldiers could swim when off duty.

Both groups had taken some non-ration pack items ("Jack rations") into the field, but these constituted only a small proportion of the total food intake during each exercise. Their influence on the acceptability of CR10M is believed to be insignificant. Of greater potential significance is the food foraged at Ex Tasman Link; marine fish were readily caught and rocks were encrusted with edible molluscs. The occasional fresh coconut was also available, washed up on the beach.

About 300 questionnaires were issued at each exercise. the questionnaire addressed all menus, including the new menu E. Unfortunately, menu E was not available for Ex Prairie Trail, so acceptability results for this previously untested menu are available only from Ex Tasman Link.

From Ex Praire Trail, 147 completed questionnaires were returned; 131 were received after Ex Tasman Link.

The results for each group were analysed using Microstat software. The results of the two groups were then combined and analysed as representing the Australian Army. Where a noticeable difference of opinion occurred between the two groups, chi square analysis (NWA Statpak) was used to determine the statistical significance of the difference. If the difference was significant at the 95% confidence level, both results are presented.

## RESULTS

Interpretation of Results: When interpreting the significance of each result in this study, careful note should be taken of the type of question asked. In some circumstances, a 50% response may be unimportant, while in others a 20% positive response may be very important. To illustrate this, several hypothetical questions and responses are given below:

(i) 'If chocolate were added to the CR10M, would you prefer dark or light chocolate?

(circle your answer)

DARK/LIGHT'

If 50% of respondents circle 'dark' and 50% prefer light, there is obviously no significant preference. Increasing the quantity of either light or dark chocolate would not increase the overall acceptability of the pack.

(ii) 'Is there sufficient chewing gum in the pack?

(circle your answer)

YES/NO'

In this case, a 50% negative response would imply that there is a strong demand for more chewing gum. Increasing the quantity of chewing gum would improve overall acceptability of the pack.

(iii) 'Which item would you most like to see added to these packs?'



If 20% of respondents identify 'instant noodles' as their most preferred item and fewer than 10% nominate any other individual item it could be safely concluded that instant noodles will be popular.

1. Characteristics of the Groups: Table 1 shows the number of respondents, major Corps and average number of years of service for each group.

**TABLE 1. Characteristics of the Sample Populations**

Regt	Number of Respondents	RAA	Percentage RAEME	In Other Corps	Average Years Service	Level of Work*
16AD	147	83	10	7	6.2	Gr. 3
1 Fd	131	89	7	4	5.6	Gr. 1

\* NH & MRC (1984)

2. Cereal Supplement (Qs 1 & 2): Table 2 shows the breakdown of issue of cereal supplement to each group.

**TABLE. 2. Issue of Cereal Supplement**

Regt	Percent Rec'd Supplement	Percent Bread	Percent Rice	Percent Biscuits
16AD	66.7	38.1	21.8	50.3
1 Fd	57.3	51.9	12.2	35.9

The total percentages and the percentages for each type of cereal differ significantly (95% confidence level) between groups.

51.8% of respondents found the cereal supplement unsatisfactory, 28.4% were satisfied and 19.8% undecided.

The most common suggestions for improving the cereal supplement were:

'More bread' — 56.1%;  
 'Increase quantity of biscuits' — 34.2%;  
 'Use wholemeal bread' — 34.5%.

A small minority (21.2%) agreed that a cereal, e.g. survival biscuits, should be included in the pack.

3. Soup Powders (Q3): Table 3 shows the popularity of soup, opinions about increasing the quantity, reducing salt content and replacement with stock cubes, for each group.

**Table 3. Percentage Liking Soup and Suggested Improvements**

Regt	Like Soup	More Soup	Less Salt	Replace With Stock Cubes
16AD	67.4	42.2	33.3	38.8
1 Fd	44.3	18.3	32.8	52.7

The percentages for all but 'Less Salt' differ significantly between groups (95% confidence level).

4. Canned Vegetables (Qs 4 & 5): Figure 1 shows the frequency distribution for flavour and amount of canned vegetables.

POTATOES (Flavour)

	Percent	
No answer	3.2	==
Very poor	6.5	====
Poor	10.8	=====
Fair	41.4	=====
Good	34.5	=====
Very good	3.6	==

POTATOES (Amount)

	Percent	
No answer	6.5	==
Not enough	15.8	=====
Enough	66.9	=====
Too much	10.8	=====

PEAS (Flavour)

	Percent	
No answer	2.5	=
Very poor	4.0	==
Poor	11.2	=====
Fair	38.5	=====
Good	36.3	=====
Very good	7.6	=====

PEAS (Amount)

	Percent	
No answer	5.4	==
Not enough	14.8	=====
Enough	73.0	=====
Too much	6.8	==

BEANS (Flavour)

	Percent	
No answer	2.5	=
Very poor	4.3	==
Poor	18.7	=====
Fair	35.3	=====
Good	34.9	=====
Very good	4.3	==

BEANS (Amount)

	Percent	
No answer	5.0	==
Not enough	14.8	=====
Enough	66.9	=====
Too much	13.3	=====

SWEET CORN (Flavour)

	Percent	
No answer	3.2	==
Very poor	6.1	==
Poor	7.9	=====
Fair	18.7	=====
Good	45.3	=====
Very Good	18.7	=====

**Figure 1.** Opinions on Flavour and Amount of Vegetables

**Figure 1. Continued**

**SWEET CORN (Amount)**

	Percent	
No answer	6.8	===
Not enough	27.3	=====
Enough	55.0	=====
Too much	10.8	=====

**TOMATOES (Flavour)**

	Percent	
No answer	2.7	=
Very poor	7.6	=====
Poor	26.6	=====
Fair	44.9	=====
Good	18.3	=====
Very Good	0.0	

**TOMATOES (Amount)**

	Percent	
No answer	6.5	===
Not enough	30.0	=====
Enough	52.7	=====
Too much	10.8	=====

**BAKED BEANS (Flavour)**

	Percent	
No answer	6.8	=====
Very poor	9.4	=====
Poor	7.9	=====
Fair	21.9	=====
Good	39.6	=====
Very good	14.4	=====

**BAKED BEANS (Amount)**

	Percent	
No answer	8.3	=====
Not enough	40.7	=====
Enough	43.2	=====
Too much	7.9	=====

**CARROTS (Flavour)**

	Percent	
No answer	3.6	==
Very poor	5.8	=====
Poor	15.1	=====
Fair	40.3	=====
Good	29.5	=====
Very good	5.8	=====

**CARROTS (Amount)**

	Percent	
No answer	4.7	=
Not enough	15.5	=====
Enough	69.1	=====
Too much	10.8	=====

More soldiers in 16AD Regt than in 1 Fd Regt were generally satisfied with the vegetables (70.1 vs 58.8%, significant at 95% confidence level). The most favoured suggestions for improvement were:

'Include some canned sweet and sour vegetables' — 66.6%;  
 "Include some canned salad vegetables, e.g. coleslaw" — 62.1%

41.0% agreed that onion, e.g. in a dehydrated form, should be added and 32.0% would like to see dehydrated vegetables, e.g. 'Surprise' peas, replace some cans.

5. Desserts (Qs 6 & 7): Figure 2 shows the distributions for frequency of consumption of fruit pudding, fruit salad and peaches.

#### FRUIT PUDDING

	Percent	
No answer	2.2	=
Never	7.2	=====
Rarely	15.5	=====
Sometimes	18.7	=====
Often	21.9	=====
Always	34.5	=====

#### FRUIT SALAD

	Percent	
No answer	1.1	
Never	2.5	=
Rarely	5.8	===
Sometimes	16.9	=====
Often	23.0	=====
Always	50.7	=====

#### PEACHES

	Percent	
No answer	1.1	
Never	4.7	==
Rarely	7.9	=====
Sometimes	10.8	=====
Often	19.1	=====
Always	56.5	=====

**Figure 2.** Frequencies of Consumption of Dessert Items

73.3% of our sample were satisfied generally with the desserts, 19.9% were dissatisfied. The most commonly suggested changes were:

'Include tropical fruit ...' — 82.3%;  
 'Increase variety generally ...' — 80.9%;  
 'Use some dried fruit ...' — 58.5%;  
 'Use some instant puddings' — 48.4%.

The suggestion that canned cherries be included was favoured by 28.4%.

6. Condiments (Q8): The most commonly identified additional condiments were:

Worcestershire sauce — 63.3%;  
 Garlic powder — 51.1%

The suggestion that spicy BBQ sauce should replace tomato sauce was favoured by 40.7%; 29.5% wanted more sugar; 36.7% wanted less salt

The addition of soy sauce, tabasco sauce and chilli powder was favoured by 44.6, 30.2 and 30.2%, respectively.

7. Spreads (Qs 9 &10): Figure 3 shows the distribution of opinions about flavour and quantity of Vegemite, butter concentrate and jam.

#### VEGEMITE (Flavour)

	Percent	
No answer	2.5	=
Very poor	6.1	=====
Poor	2.9	==
Fair	8.6	=====
Good	40.3	=====
Very Good	39.6	=====

#### VEGEMITE (Amount)

	Percent	
No answer	5.8	===
Not enough	31.7	=====
Enough	51.1	=====
Too much	11.5	=====

#### BUTTER CONCENTRATE (Flavour)

	Percent	
No answer	1.1	=
Very poor	29.1	=====
Poor	29.5	=====
Fair	25.2	=====
Good	13.0	=====
Very Good	2.2	==

#### BUTTER CONCENTRATE (Amount)

	Percent	
No answer	4.3	==
Not enough	15.5	=====
Enough	59.0	=====
Too much	21.1	=====

#### JAM (Flavour)

	Percent	
No answer	1.1	
Very poor	1.8	=
Poor	3.2	=
Fair	19.8	=====
Good	48.6	=====
Very good	25.5	=====

#### JAM (Amount)

	Percent	
No answer	4.0	==
Not enough	28.4	=====
Enough	57.2	=====
Too much	10.4	=====

**Figure 3.** Opinions of The Flavour and Amount of Spreads.

The most commonly suggested improvements to the spreads were:

- 'Include honey' — 77.0%
- 'Include lemon spread' — 55.4%
- 'Include fish paste in one menu' — 50.0%

8. Drinks (Qs 11, 12, 13, 14, 15): 65.8% of our sample normally drink tea at home; 76.3% drink coffee. Chocolate drinks such as Milo and Ovaltine are even more commonly consumed (78.1%). 'Energy' drinks, e.g. Sustagen, Strive, are taken by 42.6% and electrolyte replacers, e.g. Staminade, by 52.7% of 1 Fd Regt, 34.7% of 16 AD Regt (significant at 95% confidence level).

Figure 4 shows the distributions of opinions about flavour and amount of tea and coffee.

TEA (Flavour)		
	Percent	
No answer	7.9	=====
Poor	19.9	=====
Fair	41.9	=====
Good	30.3	=====
TEA (Amount)		
	Percent	
No answer	7.6	===
Not enough	18.7	=====
Enough	59.0	=====
Too much	14.8	=====
COFFEE (Flavour)		
	Percent	
No answer	7.2	=====
Poor	25.3	=====
Fair	37.6	=====
Good	30.0	=====
COFFEE (Amount)		
	Percent	
No answer	6.8	===
Not Enough	52.2	=====
Enough	37.4	=====
Too much	3.6	==

**Figure 4.** Flavour and Amount of Tea and Coffee

85.6% prefer tea bags compared with 6.5% who are satisfied with loose tea.

89.9% would like to see extra drinks beside tea and coffee. The most favoured extra drink is a chocolate drink such as Milo (82.4%). 71.0% of 1Fd Regt would like to see a fruit flavoured drink, compared to 52.4% of 16 AD Regt, (significantly different at the 95% confidence level). 49% favour an energy drink and 52.9% want an electrolyte replacer.

Figure 5 shows the distributions of opinions about the flavour and amount of unsweetened condensed milk.

FLAVOUR			
	Percent		
No answer	2.9	==	
Poor	24.5	=====	
Fair	37.8	=====	
Good	34.9	=====	
AMOUNT			
	Percent		
No answer	3.6	==	
Not enough	51.8	=====	
Enough	39.2	=====	
Too much	5.4	==	

**Figure 5.** Flavour and Amount of Unsweetened Condensed Milk

Less than 10% of our sample favoured any individual alternative to unsweetened condensed milk.

9. Meat Packs (Qs 16 & 17): Figure 6 shows the frequency distributions for acceptability of the various canned meats, meat and vegetables. Beside the bar graph for each meal is a list of the most common problems and the percentages who encountered those problems.

SPAGHETTI AND GROUND MEAT			
	Percent		
No answer	4.7	==	
Very poor	5.8	==	
Poor	13.7	=====	
Fair	30.9	=====	
Good	35.3	=====	
Very Good	9.7	=====	
			Problems
			Bland 7.2%
			Sloppy/Runny 5.4%
CHOPPED PORK AND CEREAL			
	Percent		
No answer	7.2	=====	
Very poor	12.2	=====	
Poor	23.4	=====	
Fair	32.0	=====	
Good	21.9	=====	
Very good	3.2	==	
			Problems
			Too fatty 13.3%
			Too salty 11.8%
			Bland 6.8%
BEEF AND GRAVY			
	Percent		
No answer	3.2	==	
Very poor	10.4	=====	
Poor	17.6	=====	
Fair	32.4	=====	
Good	28.4	=====	
Very good	7.9	=====	
			Problems
			Sloppy/Runny 11.5%
			Too fatty 4.7%
BEEF AND BEANS			
	Percent		
No answer	7.2	=====	
Very poor	8.3	=====	
Poor	13.0	=====	
Fair	45.0	=====	
Good	22.7	=====	
Very good	3.8	==	
			Problems
			Bland 6.1%

**Figure 6.** Flavour Ratings and Problems with Main Meals.

**Figure 6. Continued.**

**LUNCHEON MEAT**

	Percent		Problems
No answer	4.0	=====	Too fatty 16.2%
Very poor	20.5	=====	Bland 9.4%
Poor	21.9	=====	
Fair	27.3	=====	
Good	19.8	=====	
Very good	6.5	=====	

**BEEF AND KIDNEY**

	Percent		Problems
No answer	5.4	=====	Dislike kidney 7.6%
Very poor	24.8	=====	Totally unacceptable 4.7%
Poor	21.2	=====	
Fair	23.0	=====	
Good	19.1	=====	
Very good	6.5	=====	

**CANNED HAM**

	Percent		Problems
No answer	8.6	=====	Not enough 6.1%
Very poor	2.5	=	Too salty 4.6%
Poor	8.3	=====	
Fair	19.8	=====	
Good	39.6	=====	
Very good	21.2	=====	

**BEEF AND VEGETABLES**

	Percent		Problems
No answer	6.1	=====	Insufficient meat 4.6%
Very poor	3.6	=	
Poor	8.3	=====	
Fair	38.1	=====	
Good	38.1	=====	
Very good	5.8	=====	

**SALMON \***

	Percent		Problems
No answer	46.8	=====	N/A **
Very poor	7.6	=====	
Poor	10.8	=====	
Fair	13.3	=====	
Good	14.7	=====	
Very good	6.8	=====	

**CHICKEN AND VEGETABLES \***

	Percent		Problems
No answer	42.8	=====	N/A **
Very poor	1.8	=	
Poor	2.5	=	
Fair	11.9	=====	
Good	32.3	=====	
Very good	9.7	=====	



**Figure 6.** Continued.

**LAMB AND ROSEMARY\***

	Percent		
No answer	49.3	=====	Problems
Very poor	2.2	=	N/A **
Poor	3.2	=	
Fair	11.5	=====	
Good	24.1	=====	
Very good	9.7	=====	

\* Based on respondents from 1 Field Regiment only.

\*\* Insufficient data ) Menu E, containing Salmon, Chicken and Vegetables, Lamb and Rosemary was not available to 16 AD Regiment.

The most common general comments about the meat packs were:

'More spicy foods needed, e.g. Sweet & Sour, Beef Stroganoff' (73.0%).  
'Generally too salty' (49.3%)

34.5% agreed that quantity is usually adequate and 32.7% described the flavour as generally good.

10. Non-Food Items (Qs 18 & 19): Figure 7 shows the distribution of opinions on the usefulness of matches, can openers, toilet paper, reclosure lids and scouring pads.

**MATCHES**

	Percent	
No answer	2.9	==
Very poor	4.3	===
Poor	9.7	=====
Fair	11.9	=====
Good	39.6	=====
Very good	31.7	=====

**CAN OPENERS**

	Percent	
No answer	3.6	==
Very poor	2.9	=
Poor	6.1	===
Fair	7.6	=====
Good	33.8	=====
Very good	46.0	=====

**TOILET PAPER**

	Percent	
No answer	4.0	=====
Very poor	19.8	=====
Poor	20.5	=====
Fair	22.3	=====
Good	19.8	=====
Very good	13.7	=====

**Figure 7.** Usefulness of Non-Food Items.

**Figure 7. Continued**

**RECLOSURE LIDS**

	Percent	
No answer	4.3	==
Very poor	1.4	
Poor	5.0	===
Fair	18.4	=====
Good	45.3	=====
Very good	25.5	=====

**SCOURING PADS**

	Percent	
No answer	4.0	===
Very poor	8.6	=====
Poor	14.4	=====
Fair	18.7	=====
Good	30.2	=====
Very good	24.1	=====

11. Ration Pack — General (Qs 20-24): 33.5% of our sample believe that there is enough total food, including cereal supplement, 29.9% believe the total food is insufficient.

29.1% believe there is enough food even without cereal supplement.

The items most commonly identified for deletion were Beef and Kidney (27.7%), Luncheon Meat (16.9%), Butter Concentrate (10.0%), Chopped Pork and Cereal (7.5%) and Spaghetti & Ground Meat (6.1%).

The most commonly requested additional items were: Confectionery (chocolate, chewing gum, muesli bars, lollies) — 23.7%, Pasta — 9.2%, Chocolate Drink — 9.0%, Sweet & Sour Meals — 8.3%, Dried Fruit — 5.8%.

## DISCUSSION

The points discussed in this section were used to compile the suggested revised menu shown in Annex B.

1. Cereal Supplement (Q1): Less than two-thirds of our sample indicated that they received any cereal supplement. This is consistent with the common complaint that the cereal supplement is often not issued. This is a supply problem which needs to be overcome or the CR10M will be both energy-deficient and nutritionally-unbalanced.

It is strongly recommended that the reasons for non-issue of cereal supplement be investigated and appropriate action be taken to ensure that the supplement is issued to all users of CR10M.

Further, the pack contains items which are of little use without bread or biscuits — Vegemite, jam and butter concentrate. Rice is not an appropriate cereal supplement if the soldier wants to use the spreads.

In view of the popularity of bread, (also noted by Badcock, 1985) and the utility of biscuits, it is recommended that rice not be issued as the cereal supplement if the CR10M is being prepared by units without the assistance of members of the Australian Army Catering Corps. It is further recommended that when bread is issued, about one-third of the bread should be wholemeal, if practicable. This is in view of the higher nutrient density of wholemeal bread compared to white and our result that one-third of our sample would prefer wholemeal.

2. Soup Powders (Q3): Although a majority of our sample liked the soup, there was a significant difference between the two groups. About two-thirds of 1 Fd Regt were satisfied with the soups compared to one half of 16 AD Regt. Consistent with this are the findings that a significantly higher proportion of 16 AD Regt would like more soup and fewer would prefer stock cubes.

These differences may relate to the harsher conditions faced by 16 AD Regt. Their need for water was greater than that of the more sedentary soldiers of 1 Fd Regt. The lack of a cold drink in the CR10M means that tea, coffee and soup powder are the only materials available for flavouring water.

The differences are unlikely to be due to a greater perceived need for salt as about one-third of each group favoured reducing the salt levels of the soups.

In the absence of a consistent opinion as to acceptability of the soups, only two recommendations are made:

- (i) Reduce salt content from the current average of 16% (calculated from James et al, 1986) to a level of 12%.
- (ii) Replace tomato soup (in menu E) with mushroom soup, to increase overall variety.

3. Canned Vegetables (Qs 4 & 5): Figure 1 shows that flavour and quantity of potatoes, peas, beans, sweet corn and carrots are satisfactory. Baked beans and tomatoes are the most popular vegetables — 40.5% of our sample would like more baked beans and 30% want more tomatoes.

It is recommended that 2 x 450g of baked beans be added to another menu of CR10M.

Our sample favoured the use of some canned salad vegetables, e.g. potato salad and coleslaw. A small scale field trial conducted in 1983 showed that many soldiers are reluctant to try canned salad vegetables (G. Driver, per comm). Those who did try them found them generally acceptable.

It is recommended that canned coleslaw and canned potato salad be added to one menu, e.g. in place of peas and potatoes in menu E. This would provide one cold meal of salmon, potato salad and coleslaw.

These substitutions would have the added advantage of increasing the energy available in the CR10M.

The use of canned sweet and sour vegetables was also strongly supported (66.5%). This is consistent with the finding (discussed later) that herbs and spices and more strongly flavoured meals are needed.

The suggestion that some dehydrated vegetables should replace some canned vegetables was not well supported. Badcock (1985) suggested using dehydrated vegetables to reduce weight and bulk of CR10M. However, weight and bulk are generally not a problem as the CR10M is not intended for use by footsoldiers. Dehydrated vegetables would also fail to comply with the 'edible cold' and '10 minute preparation' required (DOD 1985). In view of these considerations and the apparently greater acceptability of canned vegetables, the substitution of some dehydrated for some canned vegetables is not recommended.

4. Desserts (Qs 6 & 7): Figure 2 shows that fruit salad and peaches are eaten more often than is fruit pudding. This is despite the inclusion of 12 cans of fruit pudding and only 4 each of peaches and fruit salad. These results, together with a strong positive response to the suggestion that the variety of desserts should be increased, suggest that a different dessert is needed in each menu. Tropical fruit and instant puddings are both popular, the puddings significantly more so with 1 Fd Regt. Creamed rice, for which a specification already exists in Australian Defence Force Food Specifications (ADFFS) would assist in increasing the energy content, but we have no data on likely acceptability. Creamed rice could be used in a new menu of CR10M.

An appropriate revised dessert menu is:

A — Fruit Cocktail; B — Fruit Pudding; C — Peaches; D — Tropical Blend Fruit Salad; E — Instant Pudding (chocolate).

Specifications exist for all these except Instant Pudding.

5. Condiments (Q8): There is a strong demand for condiments in addition to those already present (tomato sauce, curry powder, sugar, salt). The most favoured additional condiments are Worcestershire sauce and garlic powder.

It is recommended that condiments appropriate to the main meals be added to each menu. Annex B shows a suggested mix of condiments appropriate for the recommended main meals.

Although about one-third of soldiers want more sugar and less salt, discussions indicated that the present quantities of these items are 'about right'.

6. Spreads (Qs 9 & 10): Figure 3 shows that Vegemite and jam are of acceptable flavour and quantity. Although the flavour of butter concentrate is rated as low, the amount is regarded as being 'about right'. This is probably because butter concentrate is recognised as being the only feasible combination spreading/frying agent. Badcock (1985) also reported that butter concentrate, although unpopular, is felt to be necessary.

Other spreads commonly suggested were honey, lemon spread and fish paste. At present, Vegemite, jam and the unpopular butter concentrate are the only spreads in the CR10M. To increase variety, it is recommended that honey and lemon spread replace jam in two menus and that fish paste be used instead of Vegemite in one menu. A Specification exists for fish paste in ADFFS.

Annex B shows the recommended menu breakdown for spreads.

7. Drinks (Qs 11-15): At the time of this study there were 80g of coffee and 108g of tea in the CR10M, enough for a total of 9-10 hot brews per man. Even so, the demand for more coffee was strong.

The recent decision to change from loose tea to tea bags is vindicated by the overwhelming support for tea bags (85.6%).

The main demands for extra drinks concern a chocolate drink and fruit flavoured drink powder. Badcock (1985) and Forbes-Ewan & Waters (1986) also reported a strong demand for chocolate drinks in operational ration packs. If a chocolate drink is added, it is likely that the demand for the existing hot drinks, i.e. tea and coffee, will drop.

It is recommended that: (i) A chocolate drink be added to each menu — enough to make 10 brews; (ii) the quantity of tea be reduced from the current 40 to 30 tea bags; (iii) the quantity of coffee be reduced to 3 x 20g.

These changes would allow 7-8 hot drinks per man per day.

The significantly greater demand for a fruit drink powder by 1 Fd Regt. is difficult to reconcile with 16 AD Regt's greater need for water. A major factor predisposing to heatstroke is dehydration. Dehydration can occur even when water is readily available as the sense of thirst cannot keep up with the body's requirement for water (Shibolet et al, 1976). Henry (1985) states that 'the experience of the Israeli and American Defence Forces indicates that the thirst drive is inadequate in a hot environment, replacing only 66% of the body's water loss per unit time.' Hubbard et al (1983) report that flavouring water increases the quantity consumed and therefore decreases the likelihood of severe water deficiency.

Therefore, it is recommended that fruit flavoured drink powders, with a different flavour in each menu, be added to the CR10M. The quantity should be enough to give each man 1 litre of fruit flavoured drink. The recommended sweetening agent is aspartame which gives a sweetness closer to sugar than does saccharin.

The flavour of unsweetened condensed milk is adequate but Figure 5 shows that there is a strong demand for more. However, if the recommendation to reduce the quantity of tea and coffee is effected, there should be no need to increase the quantity of milk.

8. Main Meals (Qs 16 & 17): Figure 6 shows that the least acceptable meal is Beef & Kidney; 46% of respondents rated it as less than 'fair'. One of the most common comments in the field was that kidney and offal generally are no longer popular, particularly with the younger generation of soldiers. Corned Beef was also commonly described as being of poor quality. The usual comment was that if a significant increase in quality is not feasible, this item should be deleted. Forbes-Ewan & Waters (1986) reported that corned beef in the CR1M was regarded as 'fair' or better by fewer than 45% of users.

Of marginal acceptability are Canned Salmon and Luncheon Meat. However, the new menu E, containing salmon, was not available for Ex Prairie Trail. We therefore have insufficient data to make a firm recommendation about the salmon. Luncheon Meat was disliked by more than two-fifths of our sample. Only one-quarter rated it above 'fair'.

It is recommended that beef & Kidney, Corned Beef and Luncheon Meat be deleted from CR10M.

Half our sample found the meat packs to be generally too salty. This result agrees with the taste panel results reported by Forbes-Ewan (1986) which indicated that most CR10M main meals with salt contents >1% were 'salty' or 'far too salty'. The Commonwealth Department of Health recommends a maximum salt intake of about 6g/person (NH & MRC, 1984). James et al (1986) report that the salt available in the CR10M is in the range 19.8-24.6g, 3-4 times the recommended maximum. Non-

discretionary salt intake (assuming all edible items are eaten except the sachet salt) varies from 15.6-20.4g.

Forbes-Ewan (1986) discusses some of the likely consequences of excessive salt intake. In the short term, these include increased risk of heat stroke and a greater water requirement. A possible long-term result is a greater risk of developing high blood pressure.

It is recommended that a general reduction in salt contents of the 'wet packs' be made so that these items are <1% salt. James et al (1986) identified 21 CR10M items with >1% salt content. These authors also recommended a general reduction of salt in the main meal items.

There is a strong desire for more strongly flavoured foods, e.g. sweet and sour, Beef Stroganoff. If, as recommended above, Corned Beef, Beef & Kidney and Luncheon Meat are deleted, three replacement meals will be needed.

It is recommended that moderately spicy meals such as Beef Stroganoff, Sweet & Sour Pork and Ravioli replace the 3 meals recommended for deletion.

The replacement meals should not be strongly spiced. The most suitable means of satisfying the wide range of tastes to be found in a diverse population such as the Armed Forces would be to provide relatively bland meals and a range of suitable condiments.

About two-thirds of our sample believe that there is insufficient of the main meals. Also, many soldiers commented that there are no meals recognisable as specifically breakfast foods.

It is recommended that 2 x 450g cans of meals such as Ham & Eggs, Beef & Eggs, Bacon & Beans and Creamed Sweet Corn replace 2 x 450g of the current breakfast meals.

Annex B shows the recommended changes to the main meals, and has 2 x 450g Baked Beans in menu C, as recommended in Section 3, above.

9. Non-Food Items (Qs 18 & 19): The two main problems soldiers had with the non-food items were:
- (i) Poor quality toilet paper;
  - (ii) Insufficient scouring pads.

It is recommended that softer, more absorbent toilet paper be included in the CR10M.

Problem (ii) above has been solved by doubling the number of scouring pads in the CR10M, since this study took place.

10. Ration Pack General (Qs 20-24): There is a perceived need for more food, even with the cereal supplement present, by 30% of our sample.

However, an equally large proportion believe there is enough total food even without the cereal supplement.

James et al (1984) and James et al (1986) conclude that there is insufficient food in the CR10M. Menus B & C were reported to be marginally inadequate for a grade 1 level of activity (NH & MRC, 1984). Menus A & D provide more energy, but are still deficient for a grade 2 level of activity, e.g. an infantryman. James et al (1986) state that "These rations are inadequate for intended operational use". If used for an extended period then "there would be a need to increase the supplementary issue for users engaged in a grade 2 level of activity".

In view of the current unreliability of the supply of cereal supplement, our suggestion is that an increase in the energy content of the basic pack is preferable to an increase in the cereal supplement.

There are many ways in which the energy provided by the CR10M could be increased. These include:

- (i) Increasing the quantities of existing items,
- (ii) Increasing the energy density of existing items, e.g. by using higher fat, lower moisture main meals and desserts;
- (iii) Adding highly acceptable, energy dense foods such as dried fruit, cheese, sweet biscuits and confectionery to the existing packs.

Of these, (iii) is regarded as the best as it would add variety to the CR10M and help reduce the excessive protein levels (reported by James et al, 1986). In response to the question '... which two new items would you like to see?', 23.7% of our sample identified chocolate, muesli bars or some other form of confectionery. During discussion with groups of soldiers, it was clear that cheese and dried fruit would also be popular. The use of dried fruit was supported by 58.5% of our sample (Section 5 of the Results).

It is recommended that cheese, dried fruit, sweet biscuits and confectionery be used to boost the energy provided by the CR10M to the range 12500-14000kJ/man.

Annex B shows an appropriate mix of these items between menus.

The two items most commonly identified for deletion, Beef & Kidney and Luncheon Meat, were also found to be of low acceptability and their deletion has been recommended.

11. Effect of recommendations on Energy Provided by CR10M: Table 4 shows the energy provided by the current and proposed revised CR10M. The energy results are expressed as kJ/man and include the energy provided by the cereal supplement. The average energy expenditure of an infantryman is estimated to be about 13000kJ (NH & MRC, 1984).

Table 4. Energy (kJ/man) in CR10M, Current\* and Revised.

MENU	CURRENT* ENERGY (kJ/man)	ESTIMATED ENERGY OF REVISED MENU	NOTES
A	12500	12500	Value for creamed sweet corn estimated at 450kJ/100g.
B	11300	13600	Values for Beef Stroganoff and Sweet & Sour Pork assumed to be similar to those for Beef & Veg and Chicken & Veg respectively.
C	10700	12600	Value for Instant Pudding assumed similar to that of custard powder. Ravioli assumed similar to Beef Tortellini in IMCR.
D	12100	12900	Ginger Nut biscuits assumed similar to Biscuits, Jam Filled.
E	11800	13900	Canned salads from Makinson et al (1984).

\* Calculated from James et al (1986), Paul & Southgate (1979) and James, K.W., pers. comm. Includes 2500 kJ/man derived from the cereal supplement.

## **CONCLUSION**

It is many years since the CR10M was significantly altered. The ration design is basically sound but more food, a greater variety of food and drinks, and flavouring agents are now needed.

If the following recommendations are effected, the CR10M will be nutritionally adequate and it will be acceptable to most soldiers.



## RECOMMENDATIONS

A menu listing based on these recommendations is shown in Annex B.

1. Rice should be deleted from the list of cereal supplements available to units preparing the CR10M without assistance from the Australian Army Catering Corps.
2. Whenever practicable, wholemeal bread should constitute about one-third of the bread supplement.
3. It is strongly recommended that the reason(s) for non-issue of the cereal supplement be investigated and that appropriate action be taken to ensure that the supplement is made available to users of CR10M.
4. Salt contents of the soups be reduced from the current average of 16% to an average of 12% salt.
5. Mushroom soup is to replace tomato soup in menu E.
6. Replace two cans of Beef & Veg Curry with 2 cans of Baked Beans in menu C.
7. Canned Coleslaw (2 x 450g) should replace Peas (2 x 450g) and Canned Potato Salad (2 x 450g) should replace 2 x 450g potatoes in menu E.
8. Use a different dessert in each menu, e.g. A — Fruit Cocktail; B — Fruit Pudding; C — Peaches; D — Tropical Blend Fruit Salad; E — Instant Pudding.
9. Condiments such as Worcestershire sauce, garlic powder and mustard should be added, appropriate to the main meals in each menu.
10. Replace jam with honey and lemon spread respectively, in two menus. Replace Vegemite with fish paste in one menu.
11. A chocolate drink such as Milo should be added. Reduce the quantity of coffee from 4 x 20g to 3 x 20g; reduce the tea from 40 tea bags to 30 tea bags.
12. Add a fruit flavoured drink powder; the recommended sweetening agent is aspartame. Quantity should be enough to make 1 litre of drink per man. Each menu should have its own flavour.
13. Delete Corned Beef, Beef & Kidney and Luncheon Meat. Moderately spicy meals such as Beef Stroganoff, Sweet & Sour Pork and Ravioli should replace the deleted meals.
14. Reduce the salt levels in the 'wet' canned main meals to a maximum of 1% salt.
15. Foods such as Ham & Eggs, Beef & Eggs, Bacon & Beans and Creamed Sweet Corn should replace some of the current breakfast cans to allow preparation of meals which are recognisable as traditional breakfast foods.
16. Softer, more absorbent toilet paper should replace the current, upopular toilet paper.
17. Add cheese, dried fruit, sweet biscuits and confectionery to increase the energy provided by the CR10M to 12500-14000kJ/man (including cereal supplement).

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**ANNEX A:** Comments Obtained From the Field.

1. The packs need cold drinks. This was the most common comment obtained, both at Woomera and Shoalwater Bay
2. Many soldiers would like to see a chocolate drink as well as tea and coffee.
3. Confectionery is needed — especially of the "all day sucker" type. This would give the soldier an alternative to smoking, help to relieve thirst and provide a slight energy boost while on patrol. Barley sugar, butterscotch, fruit drops and hard toffee are all suitable. Chewing gum, muesli bars and chocolate would also be popular.
4. There is a demand for a greater variety of desserts. Creamed rice, jellied fruit, instant puddings, custard and a greater variety of canned fruit were all frequently mentioned.
5. More scouring pads are needed.
6. The cereal supplement is not always issued. Many soldiers favoured the inclusion of a small quantity of survival biscuits, e.g. 5 x 42g packets in each sleeve. The bread supplement could then be issued say twice each week. This would ensure that soldiers could use items such as Vegemite and jam.
7. The AACC would like a supplementary pack available for their use only. The pack could contain pastry, custard powder, egg powder and other culinary adjuncts.
8. Disposal of rubbish (cans, plastic containers, etc.) would be facilitated by the inclusion of a green garbage bag in each sleeve.
9. Tea bags should replace loose tea.
10. Coffee is more popular than tea; the quantity of coffee should be increased at the expense of tea.
11. There are no items recognisably designed for breakfast. Porridge or other breakfast cereal, cans with egg, e.g. Ham and Egg are needed to break the monotony of eating stew three times a day
12. Beef and Kidney is very unpopular; the quantity should be reduced or it could be deleted
13. A greater range of condiments is needed, e.g. barbecue sauce, Worcestershire sauce, herbs and spices.
14. Dried fruit or fruit and nuts would be popular
15. There is a demand for a cereal such as rice or noodles
16. Many soldiers would like sweet biscuits to be added to each pack, a different variety in each menu.
17. Greater variety of main meal cans is needed. Use could be made of ethnic cuisines, e.g. Chinese, Indian, Italian. Sweet and sour, curries and pasta dishes such as lasagna and ravioli were all mentioned.
18. Weight and volume could be saved by replacing at least some of the canned vegetables with dehydrated vegetables, e.g. Surprise peas, beans, carrots and sweet corn

19. Cheese would be very popular.

20. A small cake of soap could be included in each sleeve to encourage the food preparer to maintain an adequate standard of hygiene.

21. Canned salads, e.g. coleslaw would provide a welcome change from vegetables which need to be heated.

22. Recipes for appetising and varied meals could be printed on the reverse of the contents sheet.

# ANNEX B: Sample Revised Menu

## A

Spaghetti & Ground Meat	2 x 450g
Creamed Sweet Corn	2 x 450g
Chopped Pork & Cereal	4 x 340g
Beef & Gravy	4 x 450g
Potatoes	4 x 450g
Peas, Green	2 x 440g
Tomatoes	2 x 425g
Coffee	3 x 20g
Tea	30 x Tea bags
Milo	2 x 150g
Fruit Drink Pdr. (orange)	2 x 100g
Sugar	6 x 142g
Milk Cond. Unsweetened	2 x 410g
Butter Concentrate	2 x 150g
Vegemite	2 x 50g
Jam, Blackberry	2 x 255g
Tomato Sauce	1 x 110g
Worcestershire Sauce	1 x 30g
Curry Pdr.	1 x 14g
Beef Noodle Soup Pdr.	1 x pouch
Fruit Cocktail	4 x 425g
Muesli Bars	10 x 32g
Lifesavers, Tropical 5	10 pkts

## B

Beef & Beans	2 x 450g
Bacon & Beans	2 x 450g
Beef Stroganoff	4 x 450g
Sweet & Sour Pork	4 x 450g
Potatoes	4 x 450g
Peas, Green	2 x 440g
Sweet Corn	2 x 440g
Coffee	3 x 20g
Tea	30 x Tea Bags
Milo	2 x 150g
Fruit Drink Pdr. (pineapple)	2 x 100g
Sugar	6 x 142g
Milk Cond. Unsweetened	2 x 410g
Butter Concentrate	2 x 150g
Vegemite	2 x 50
Honey	2 x 255g
Tomato Sauce	1 x 110g
Garlic Pdr.	1 x 14g
Curry Pdr.	1 x 14g
Tomato Soup Pdr.	1 x pouch
Fruit Pudding	4 x 380g
Cheese	2 x 100g
Chocolate (ration)	10 x 50g

## C

Beef & Veg Curry	2 x 450g
Baked Beans	2 x 450g
Ravioli	4 x 450g
Beef & Tomato Puree	4 x 450g
Potatoes	4 x 450g
Beans, Green	2 x 440g
Carrots	2 x 440g
Coffee	3 x 20g
Tea	30 x Tea bags
Milo	2 x 150g
Fruit Drink Pdr. (lemon)	2 x 100g
Sugar	6 x 142g
Milk Cond. Unsweetened	2 x 410g
Butter Concentrate	2 x 150g
Fish Paste	2 x 50g
Jam, Raspberry	2 x 255g
Tomato Sauce	1 x 110g
Garlic Pdr.	1 x 14g
Chickn noodle Soup	1 x pouch
Instant Pudding (choc)	2 x 225g
Biscuits, Jam Sandwich	5 x 85g
Candy, Sweet & Sour	2 x 150g

## D

Beef & Dumplings	2 x 450g
Beef & Eggs	2 x 450g
Ham, Canned	4 x 340g
Beef & vegetables	4 x 450g
Potatoes	4 x 450g
Beans, Green	2 x 440g
Baked Beans	2 x 440g
Coffee	3 x 20g
Tea	30 x Tea bags
Milo	2 x 150g
Fruit Drink Fdr. (lime)	2 x 100g
Sugar	6 x 142g
Milk Cond. Unsweetened	2 x 410g
Butter Concentrate	2 x 150g
Vegemite	2 x 50g
Lemon Spread	2 x 255g
Tomato Sauce	1 x 110g
Mustard	1 x 14g
Pea & Ham Soup	1 x pouch
Tropical Blend Fruit Salad	4 x 425g
Biscuits, Ginger Nut	5 x 85g
Chocolate (ration)	10 x 50g

**E**

Chicken & Vegetables	2 x 450g	Sugar	6 x 142g
Ham & Eggs	2 x 450g	Milk Cond. Unsweetened	2 x 410g
Salmon	2 x 450g	Butter Concentrate	2 x 150g
Lamb & Rosemary	4 x 450g	Vegemite	2 x 50g
Potato Salad	2 x 340g	Jam	2 x 255g
Coleslaw	2 x 450g	Tomato Sauce	1 x 110g
Potatoes	2 x 450g	Curry Pdr.	1 x 14g
Sweet Corn	4 x 425g	Mushroom Soup Pdr.	1 x pouch
Coffee	3 x 20g	Peaches	4 x 425g
Tea	30 x Tea bags	Cheese	2 x 100g
Milo	2 x 150g	Raisins	2 x 150g
Fruit Drink Pdr. (apple)	2 x 100g		

**SUNDRIES (all Menus)**

Salt 6 x 7g; Matches 2 Boxes; Can Openers 2; Toilet Paper 2 x 50 Sheets; Reclosure lids 4;  
4 x Scouring Pads.

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## COMBAT RATION TEN MAN QUESTIONNAIRE

As a user of these rations you are in the best position to advise us on any changes needed to improve their acceptability.

Please complete this questionnaire by being both critical and fair. With your co-operation we will be able to improve the Combat Ration Ten Man for you, the user. All answers are confidential - we do not want name, rank or number, just the following information.

Corps: \_\_\_\_\_ ARA/ARES (circle correct name)

Number of Years of Service: \_\_\_\_\_

## EXPLANATION OF QUESTIONS

This questionnaire contains four styles of question:

1. The Rating Scale consists of a series of words. You answer by drawing a circle around the word that best fits your answer. For example:

"For the following item, indicate your opinion of the flavour by circling the appropriate word(s).

Victorian beer

VERY GOOD GOOD FAIR POOR VERY POOR"

This would mean that you like Victorian beer, but you do not think it is very good.

2. The simple YES/NO question where you place a circle around the answer with which you agree.

3. The checklist gives a series of possible answers. You place a tick in the box beside each answer with which you agree. For example:

"Tick all the following statements about beer with which you agree:

Tasmanian beer is wonderful	[ ]
N.S.W. beer is the best beer in the world.	[✓]
W.A. beer tastes like drain water	[ ]
Queensland beer is second only to N.S.W.	[✓]

This would mean that you think N.S.W. beer is the best in the world, Queensland beer is second best; you would not agree that Tasmanian beer is wonderful or that W.A. beer tastes like drain water.

4. The open response question which asks you to give a simple written answer to the question. This is identified by a line.

If you did not try some items on this exercise, you may still answer all the questions on those items if you are familiar with them from previous exercises.

**QUESTIONS**

**CEREAL SUPPLEMENT**

1. Did you receive the cereal supplement (bread, rice or biscuits)?

(circle your answer)

YES/NO

If "YES", which of the following cereals did you receive? (Place a tick in the box beside the correct answer(s):

BREAD [ ]

RICE [ ]

BISCUITS [ ]

2. Is the cereal supplement satisfactory?

(circle your answer)

NO/YES

Could the cereal supplement be improved (tick all the following suggestions with which you agree)?

DELETE RICE [ ]

INCREASE QUANTITY OF BISCUITS [ ]

USE WHOLEMEAL BREAD [ ]

MORE RICE [ ]

DELETE BISCUITS [ ]

MORE BREAD [ ]

INCLUDE A CEREAL, e.g. SURVIVAL BISCUITS, IN THE RATION [ ]

OTHER (please describe):

---

**SOUP POWDERS**

3. Do you like the soup powders?

(circle your answer)

YES/NO

Tick all the following changes you would like to see made to the soup powders

INCREASE QUANTITY [ ]

REDUCE SALT CONTENT [ ]

REPLACE WITH STOCK CUBES [ ]

OTHER (please describe):

---

#### CANNED VEGETABLES

4. For each of the following items please give your opinion of both flavour and quantity by circling the appropriate word(s):

##### CUT POTATOES

Flavour:	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
Quantity:	NOT ENOUGH	ENOUGH	TOO MUCH		

##### PEAS

Flavour:	VERY POOR	POOR	FAIR	GOOD	VERY GOOD
Quantity:	NOT ENOUGH	ENOUGH	TOO MUCH		

##### BEANS

Flavour:	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
Quantity:	NOT ENOUGH	ENOUGH	TOO MUCH		

##### SWEET CORN

Flavour:	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
Quantity:	TOO MUCH	ENOUGH	NOT ENOUGH		

##### TOMATOES

Flavour:	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
Quantity:	NOT ENOUGH	ENOUGH	TOO MUCH		

##### BAKED BEANS

Flavour:	VERY POOR	POOR	FAIR	GOOD	VERY GOOD
Quantity:	TOO MUCH	ENOUGH	NOT ENOUGH		

##### CARROTS

Flavour:	VERY POOR	POOR	FAIR	GOOD	VERY GOOD
Quantity:	NOT ENOUGH	ENOUGH	TOO MUCH		

**CANNED VEGETABLES-GENERAL**

5. Were you satisfied with the canned vegetables generally?

(circle your answer)

NO/YES

Which of the following changes to the vegetables would you like to see made (tick all with which you agree)?

INCLUDE SOME CANNED SALAD VEGETABLES eg COLESLAW [ ]

INCLUDE SOME CANNED SWEET AND SOUR VEGETABLES [ ]

ADD ONION eg AS DEHYDRATED ONION [ ]

REPLACE SOME CANS WITH DEHYDRATED eg "SURPRISE" PEAS [ ]

OTHER (please describe)

---

**DESSERTS**

6. Please indicate how often you eat each of the following dessert items in the field by placing a circle around the appropriate word:

FRUIT PUDDING: ALWAYS      OFTEN      SOMETIMES      RARELY      NEVER

FRUIT SALAD: NEVER      RARELY      SOMETIMES      OFTEN      ALWAYS

PEACHES: ALWAYS      OFTEN      SOMETIMES      RARELY      NEVER

**DESSERTS - GENERAL:**

7. Were you satisfied generally with the canned desserts?

(circle your answer)

NO/YES

Tick all the following changes that you would like to see made to the canned fruits:

INCLUDE TROPICAL FRUIT eg PINEAPPLE or TROPICAL FRUIT SALAD [ ]

INCREASE VARIETY GENERALLY eg DIFFERENT DESSERT IN EACH MENU [ ]

INCLUDE CHERRIES [ ]

USE SOME DRIED FRUIT eg DRIED APRICOTS, SULTANAS, APPLES, PRUNES. [ ]

USE SOME INSTANT PUDDINGS [ ]

OTHER (please describe):

---

**CONDIMENTS (Tomato sauce, sugar, salt)**

8. Tick all the following changes to the condiments you would make:

REPLACE TOMATO SAUCE WITH SPICY BBQ SAUCE	[ ]
ADD WORCESTERSHIRE SAUCE	[ ]
ADD SOY SAUCE	[ ]
ADD TABASCO SAUCE	[ ]
INCLUDE CHILLI POWDER	[ ]
INCLUDE CURRY POWDER	[ ]
INCLUDE GARLIC POWDER	[ ]
INCREASE SUGAR	[ ]
DECREASE SALT	[ ]

OTHER (please describe):

---

**SPREADS**

9. Please give your opinion of the flavour and quantity of each of the following spreads:

**VEGEMITE**

Flavour:	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
Quantity:	NOT ENOUGH	ENOUGH	TOO MUCH		

**BUTTER CONCENTRATE**

Flavour:	VERY POOR	POOR	FAIR	GOOD	VERY GOOD
Quantity:	TOO MUCH	ENOUGH	NOT ENOUGH		

**JAM**

Flavour:	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
Quantity:	NOT ENOUGH	ENOUGH	TOO MUCH		

#### SPREADS - GENERAL

10. Tick all the following changes to the spreads you would like to see:

- |   |                          |
|---|--------------------------|
| INCREASE QUANTITY OF BUTTER CONCENTRATE | <input type="checkbox"/> |
| INCLUDE HONEY                           | <input type="checkbox"/> |
| INCLUDE LEMON SPREAD                    | <input type="checkbox"/> |
| INCLUDE FISH PASTE IN ONE MENU          | <input type="checkbox"/> |
| DECREASE QUANTITY OF JAM                | <input type="checkbox"/> |
| REDUCE QUANTITY OF BUTTER CONCENTRATE   | <input type="checkbox"/> |
| OTHER (please describe):                |                          |
- 

#### DRINKS

11. Tick all the following drinks that you normally drink at home:

- |                                    |                          |
|------------------------------------|--------------------------|
| TEA                                | <input type="checkbox"/> |
| COFFEE                             | <input type="checkbox"/> |
| CHOCOLATE DRINK eg MILO, OVALTINE  | <input type="checkbox"/> |
| "ENERGY" DRINK eg SUSTAGEN, STRIVE | <input type="checkbox"/> |
| ELECTROLYTE-REPLACER eg STAMINADE  | <input type="checkbox"/> |

12. For each of the brews (tea and coffee), circle the appropriate words to describe the quantity and flavour:

##### TEA

Quantity:	TOO MUCH	ENOUGH	NOT ENOUGH
Flavour:	GOOD	FAIR	POOR

##### COFFEE

Quantity:	TOO MUCH	ENOUGH	NOT ENOUGH
Flavour:	GOOD	FAIR	POOR



13. Was the tea packed in a suitable form or would you prefer tea bags?

(circle your answer)

loose tea/tea bags

14. Would you like other drinks as well as tea and coffee?

(circle your answer)

YES/NO

If "YES", tick all the following you would like:

FRUIT DRINK POWDER eg TANG [ ]

CHOCOLATE DRINK eg MILO or OVALTINE [ ]

"ENERGY" DRINK eg STRIVE or SUSTAGEN [ ]

GLUCOSE & ELECTROLYTE-REPLACER eg STAMINADE, GATORADE [ ]

OTHER (please describe):

---

15. Give your opinion of the flavour and quantity of the unsweetened condensed milk by circling the appropriate words below:

Flavour:            GOOD            FAIR            POOR

Quantity:           TOO MUCH       ENOUGH       NOT ENOUGH

If the unsweetened condensed milk was unsatisfactory can you suggest a suitable alternative?

---

## MEAT PACKS

16. The following series of questions asks you to give your opinion of the flavour of the various canned meats. There is also a section headed "Problems" for each item. Problems may be "Too salty", "Too fatty", "Not enough vegetables", "Insufficient quantity", "Too bland", "Nothing to chew on" and so on.

### SPAGHETTI AND GROUND MEAT

Flavour:      VERY GOOD      GOOD      FAIR      POOR      VERY POOR

Problems: \_\_\_\_\_

### CHOPPED PORK AND CEREAL

Flavour:      VERY GOOD      GOOD      FAIR      POOR      VERY POOR

Problems: \_\_\_\_\_

### BEEF AND GRAVY

Flavour:      VERY GOOD      GOOD      FAIR      POOR      VERY POOR

Problems: \_\_\_\_\_

### BEEF AND BEANS

Flavour:      VERY POOR      POOR      FAIR      GOOD      VERY GOOD

Problems: \_\_\_\_\_

### LUNCHEON MEAT

Flavour:      VERY GOOD      GOOD      FAIR      POOR      VERY POOR

Problems: \_\_\_\_\_

### BEEF AND KIDNEY

Flavour:      VERY POOR      POOR      FAIR      GOOD      VERY GOOD

Problems: \_\_\_\_\_

**HAM CANNED**

Flavour:      VERY GOOD      GOOD      FAIR      POOR      VERY POOR

Problems: \_\_\_\_\_

**BEEF AND VEGETABLES**

Flavour:      VERY POOR      POOR      FAIR      GOOD      VERY GOOD

Problems: \_\_\_\_\_

**CHICKEN AND VEGETABLES**

Flavour:      VERY POOR      POOR      FAIR      GOOD      VERY GOOD

Problems: \_\_\_\_\_

**TUNA IN BRINE**

Flavour:      VERY POOR      POOR      FAIR      GOOD      VERY GOOD

Problems: \_\_\_\_\_

**LAMB AND ROSEMARY**

Flavour:      VERY GOOD      GOOD      FAIR      POOR      VERY POOR

Problems: \_\_\_\_\_

**MEAT PACKS - GENERAL**

17. Please tick all the following comments about the canned meat item with which you agree:

GENERALLY TOO SALTY [   ]

FLAVOUR GENERALLY GOOD [   ]

QUANTITY USUALLY ADEQUATE [   ]

MORE SPICY FOODS NEEDED eg SWEET AND SOUR, BEEF STROGANOFF [   ]

OTHER (please describe): [   ]

**NON-FOOD ITEMS**

18. What is your opinion of the usefulness of the matches, can-openers, toilet paper, reclosure lids and scouring pads? Please circle the words which best match your opinion:

MATCHES	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
CAN OPENERS	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
TOILET PAPER	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
LIDS	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
SCOURING PADS	VERY GOOD	GOOD	FAIR	POOR	VERY POOR

19. Can you think of any improvements which could be made to the non-food items? For example, was the toilet paper absorbent enough, are there enough matches, is there enough soap in the scouring pads?

---

---

**RATION PACK - GENERAL**

If you did not receive the cereal supplement, (bread, rice or biscuits), then leave question 20 blank, answer question 21 instead.

20. Was the total amount of food (including the cereal supplement) enough for 10 men for one day?

(circle your answer)

YES/NO

21. If you did not receive the cereal supplement, was there enough food for 10 men for one day, anyway?

(circle your answer)

NO/YES

22. If 2 items were to be deleted from the ration, which 2 items would you prefer to see go?

DELETE: \_\_\_\_\_

DELETE: \_\_\_\_\_

23. If 2 items were to be added to the ration which 2 new items would you like to see?

ADD: \_\_\_\_\_ ADD: \_\_\_\_\_

24. List any further comments or suggestions you have for improving the Combat Ration Ten Man, not already covered in this questionnaire:

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Thank you for taking the time to fill out this questionnaire. Your co-operation will help us to improve the acceptability of the Combat Ration Ten Man for you, the user.

DATE  
FILMED  
-8